

Title: Non-invasive Corrosion Sensor

Application Number: 10/744,649
Response to Office Action mailed 12/15/2004
Navy Case Number 85003**Specification Amendments**

Please make the following changes to the specification:

On Page 2, lines 15-20:

The present invention is directed to a non-invasive corrosion sensor. The non-invasive corrosion sensor includes a heat sink, ~~a~~ at least two peltiers, a reference standard and a data acquisition device. ~~The Each~~ Each peltier has a ~~first negative~~ first negative side and a ~~second positive~~ second positive side, and ~~the each~~ each peltier communicates with the heat sink such that the ~~first negative~~ first negative side of ~~the each~~ each peltier is maintained at a common temperature. The reference standard communicates with the positive side of one of the peltiers while ~~and the test piece communicates with the second the positive side of the other peltier~~; and the data acquisition ~~device~~ device is able to record and compare the differences in temperatures between the test piece and the reference standard. A higher temperature in the test piece than in the reference standard indicates the presence of corrosion. The differences in temperatures of the test piece and the reference standard are obtained via electrical currents in the peltiers.

On Page 3, lines 15-21:

The preferred embodiments of the present invention are illustrated by way of example in Figures 1 and 2. As seen in Figure 1 and 2, the non-invasive corrosion sensor 10 includes a heat sink 100, at least two peltiers 200, and a reference standard 300. ~~The Each~~ Each peltier 200 may include a positive side 201 and a negative side 202. The peltiers 200 communicates with the heat sink 100 such that the negative side 202 of each of the peltiers 200 is maintained at a common temperature. The reference standard 300 communicates with the positive side 201 of one of the peltiers while ~~and the test piece 50 communicates with the positive side 201 of the other peltier~~

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200. A data acquisition ~~device~~ device 400 may be utilized to record and compare the differences in temperatures of the test piece 50 and the reference standard 300.

On Page 4, lines 16-17:

The data acquisition ~~device~~ device 400 may be defined, but without limitation, as a ~~device~~ device capable of measuring and recording small electrical currents.

On Page 6, lines 8-15:

The leads 220 of the peltiers 200 are connected to the data acquisition ~~device~~ device 400. The negative side 202 of each peltier 200 is maintained at a common temperature through contact with the common heat sink 100. The opposing positive side 201 of each peltier 200 (reference peltier 210 and test piece peltier 215) is in contact with the reference standard 300 and the test piece 50 respectively. A difference in temperatures between the reference standard 300 and the test piece 50 will generate a differing electrical current from each peltier 200. This output is recorded and compared (reference vs. test piece) by the data acquisition ~~device~~ device 400. An increase in current from the test piece peltier 215 over the reference peltier 210 indicates a positive heat differential and the presence of corrosion.